

*Amendment* 10/557103

PATENT COOPERATION TREATY

IAP6 Rec'd PCT/PTO 15 NOV 2005

International Application No.: PCT/US04/15082

International Filing Date: 13 May 2004

Agent's File Reference: Docket 2003/01 PCT

Applicant: Invista Technologies, S.à.r.l.

Title: TOLUATE ESTER FOR USE AS REACTIVE AND  
NON-REACTIVE DILUENT IN POLYMER  
APPLICATIONS

Charlotte, North Carolina

Mail Stop PCT  
Commissioner of Patents and Trademarks  
P. O. Box 1450  
Alexandria, VA 23313-1450

Dear Sir:

I, Nancy Burns, do hereby certify that the foregoing or attached documents are being deposited with the United States Postal Service as Express Mail in an envelope addressed to: **Mail Stop PCT**, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450 on September 27, 2005.



Nancy Burns  
Nancy Burns

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Dear Sir:

In Response to the Notice of Transmittal of the International Preliminary Report on Patentability issued August 8, 2005, kindly amend the application as follows:

**Amendments to the Claims** begin on Page 2 of this report.

**Remarks** being on Page 5 of this report.

**AMENDMENTS TO THE CLAIMS**

What is claimed is:

- 1) (Currently Amended) A toluate based ester useful as a plasticizer, extender, or diluent in polymer formulations, such as in binders, comprising: ~~a mono- or diester prepared from the reaction product of toluic acid or its ester equivalent, with ethylene, diethylene, triethylene glycol, butanediol, or other aliphatic diols.~~
- 2) (Currently Amended) The toluate based ester of claim 1, wherein said ~~ester reaction product~~ is a low viscosity, low volatility liquid at 25° C.
- 3) (Currently Amended) The toluate based ester of claim 1, wherein said ~~ester reaction product~~ has a viscosity of less than about 0.35 pascal second.
- 4) (Currently Amended) The toluate based ester of claim 1, wherein said toluic ester equivalent is an enriched stream of a Witten dimethyl terephthalate process.
- 5) (Currently Amended) The toluate based ester of claim 1, wherein said toluic ester equivalent is methyl-p-toluate.
- 6) (Currently Amended) The toluate based ester of claim 1, said reaction product further including tall oil fatty acids or modified tall oil fatty acids.
- 7) (Currently Amended) The toluate based ester of claim 1, said reaction product further including canola oil, castor oil, clove oil, coconut oil, corn oil, cottonseed oil, jojoba oil, linseed oil, olive oil, palm oil, peanut oil, safflower oil, sesame oil, soybean oil, or sunflower oil.
- 8) (Original) A method of making a toluate-based diluent ester by reacting methyl-p-toluate with ethylene, diethylene, triethylene glycol, butanediol, or other aliphatic diols.

9) (Currently Amended) The method of claim 8, wherein ~~said preparation of~~ said ester is produced from a methyl-p-toluate rich stream from a Witten dimethyl terephthalate process.

10) (Original) The method of claim 8, wherein said ester is a low viscosity liquid at 25° C.

11) (Original) The method of claim 8, wherein said ester has a viscosity of < 0.35 Pa.s.

12) (Currently Amended) A ~~composition~~ blend of a polymer and toluate ester as plasticizer, diluent, or extender.

13) (Currently Amended) The ~~composition~~ blend of claim 12, wherein said toluate ester is prepared by reacting methyl-p-toluate with ethylene, diethylene, triethylene glycol, butanediol, or other aliphatic diols.

14) (Currently Amended) The ~~composition~~ blend of claim 12, wherein said toluate ester is modified with long chain hydrocarbon such as tall oil fatty acid and natural oil.

15) (Currently Amended) The ~~composition~~ blend of claim 14, wherein said tall oil fatty acid includes modified tall oil fatty acid.

16) (Currently Amended) The ~~composition~~ blend of claim 14, wherein said natural oil is canola oil, castor oil, clove oil, coconut oil, corn oil, cottonseed oil, jojoba oil, linseed oil, olive oil, palm oil, peanut oil, safflower oil, sesame oil, soybean oil, or sunflower oil.

17) (Currently Amended) The ~~composition~~ blend of claim 12, wherein said polymer is a homopolymer or a copolymer of PVC.

18) (Currently Amended) The composition blend of claim 17, wherein said toluate ester comprises from about 3 wt. % to about 50 wt. % of the total weight of the composition.

19) (Currently Amended) The composition blend of claim 12, wherein said polymer is a phenolic resin.

20) (Currently Amended) The composition blend of claim 12, wherein said toluate ester comprises from about 10 wt. % to about 65 wt. % of the composition.

21) (Original) A foundry molding composition comprising: sand; either phenol-formaldehyde resin or polyether polyol; polyisocyanate; catalyst; and a low volatility diluent toluate ester.

22) (Original) The composition of claim 21, wherein said toluate ester is a mono-or diester of toluic acid.

23) (Original) The composition of claim 21, wherein said toluate ester is modified with long chain hydrocarbon such as tall oil fatty acid or natural oil.

24) (Original) The composition of claim 23, wherein said tall oil fatty acid includes modified tall oil fatty acid.

25) (Original) The composition of claim 23 wherein said natural oil is canola oil, castor oil, clove oil, coconut oil, corn oil, cottonseed oil, jojoba oil, linseed oil, olive oil, palm oil, peanut oil, safflower oil, sesame oil, soybean oil, or sunflower oil.

## REMARKS

The Examiner has rejected Claims 4, 6 and 7 stating that these claims depend from Claim 1 which is drawn to an ester, but these specific claims contain limitations directed to a composition. Claim 1, is a reaction product. Claim 4 merely further clarifies one of the raw materials for the reaction product. Claims 6 and 7 state that the reaction product further includes tall oil fatty acids or certain natural oils. These claims as amended are believed to be in suitable order for examination.

Claims 9, 10 and 11, which depend from a method of making (Claim 8) are further stated to be limited to a product. Product by process limitations are known and are acceptable. More specifically, Claim 9 is drawing to the method of Claim 8 and further states that the methyl p-toluate comes from a specific source as a raw material. Claims 10 and 11, contrary to the Examiner's position, further limit the method by covering specific properties. Claim 8 specifically calls for a method of making an ester and Claims 10 and 11 call for the ester to have a low viscosity.

The Examiner states that Claims 21 and 25 are directed to a composition. The Examiner states that the term catalyst embraces multiple possibilities and is unclear what satisfies the limitation of the composition. The Examiner concludes therefore that the composition is unsearchable: In fact, what is known as "catalysts" are well known. Furthermore, it is known that catalysts appear in compositions, they are not "used up in the reaction". Lastly, if the Examiner is incapable of understanding what is meant by a catalyst, he merely has to refer to the specification which has further elucidations therein.

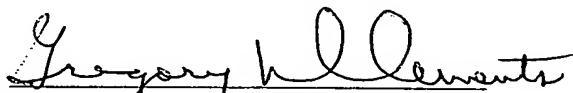
The Examiner rejects Claims 1-3, 5, 8, 12 and 13 as lacking inventive step as being obvious over Mozingo et al. The Examiner states that Mozingo et al disclose methyl p-toluate. More specifically, Mozingo et al describe a hydrogenolysis of aromatic esters to alcohol. This reference has no bearing on the present application which uses methyl p-toluate as a starting raw material to make an ester that has low viscosity.

Claims 1-3, 5, 8, 12 and 13 are stated as lacking novelty over Arendt et al (U. S. Patent 5,990,214). Arendt discloses a blend of di- and triethylene bibenzoate. It is stated

that the blend of di- and triethylene bi-benzoate have a lower melting point than either of the esters by themselves. Although it discloses di- and triethylene ditoluate, there is nothing to support a blend of these two esters having a lower melting point than the ditoluates themselves. Furthermore, there is nothing to support the fact that the ditoluates can be made into an ester which has low viscosity such as the present invention. The present invention is not concerned with a blend of esters having a low melting point. Arendt et al does not have any examples using toluic acid with DEG and/or TEG (triethylene glycol). The esters of Arendt et al are prepared in situ by reacting benzoic acid with a mixture of DEG and TEG. The present invention relative to Claims 1-11 is not a blend. In particular, the present invention prepares a single ester not a blend of esters.

The claims have been amended to enhance the understanding of the claims by an Examiner. The claims have not been amended in view of the prior art. Clearly the prior art does not disclose the invention as claimed.

Respectfully submitted,



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